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Magnetic Packages for Vertical-Bloch-Line (VBL) Memory Chips

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Beyond the usual functions of electronic packages, magnetic packages for **VBL** memory chips have to provide the following: 1) a DC magnetic bias field of about 200 Oersted, 2) a high frequency (some MHz) bit-propagation field with about 10 Oersted pulse height, 3) shielding against external fields. The requirement for uniformity and stability of the internal fields is about 1 Oersted.

Two principal types of magnetic package designs, found in the literature for magnetic bubble memories, are reanalyzed for their adaptation to VBL memories. The first type consists of a slab ceramic magnet facing the memory chip(s) with a sleeve type mumetal enclosure, which acts as flux homogenizer, return, and shield. The bit-propagation field is provided by an aircoil surrounding the chip(s), which is also used for fine tuning the DC field. This design is found appropriate for a single chip and may be extended to a single row of chips.

The second type of design consists in principle of two parallel mumetal plates with two bar magnets at opposite edges. The mumetal plates distribute the flux of the magnets very uniformly over the airgap between the plates over a long distance. However, this arrangement is too sensitive to external flux closures. Therefore, one mumetal plate is extended to wrap completely around the second one, thereby providing a shielded package with two magnetically biased cavities for multichip memories. Fine tuning of the bias field can be easily achieved by shunting screws. his package is a reasonable candidate for a PCMCIA standard.

Results of 2-dimensional magnetostatic simulations prove the feasibility of the two types of package designs. Experimental results, available for the first type, show that the design goals have been met.

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